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#### (54) Packaging elements

(87) A packaging element, for example a shock-absorbing end cap for an article, is made from a pad (10) of foamed rubber or plastics, preferably closed-cell foamed polyethylene. Parallel to each edge a plurality of collinear score lines (11 to 18) are cut into one face of the pad, and between adjacent ends of each pair of collinear score lines the material is cut through to make formations (21), preferably of dovetail shape. Also, cuts (25a and 27a) are made between adjacent edge portions (24 to 27). To set-up the packaging element the edge portions (24 to 27) are turned through 90° about their respective hinges formed by

the scoring. The dovetail formations (21) leave apertures in the central portion (22) but because of their shape resist return to the apertures and thus hold the element in its set-up condition. In an alternative embodiment (Fig. 4) wherein the formations are rectangular in plan, the turned edge portions are held in position by strips of stiff card bridging the apertures formed in the central portion.

Fig. 1

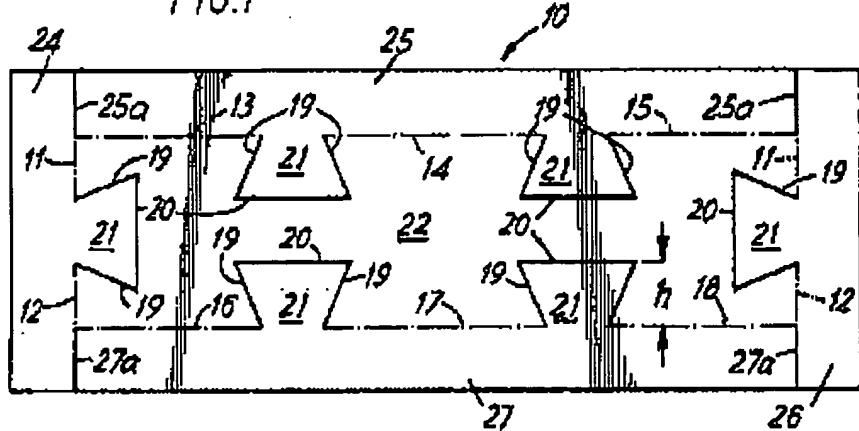


Fig. 1

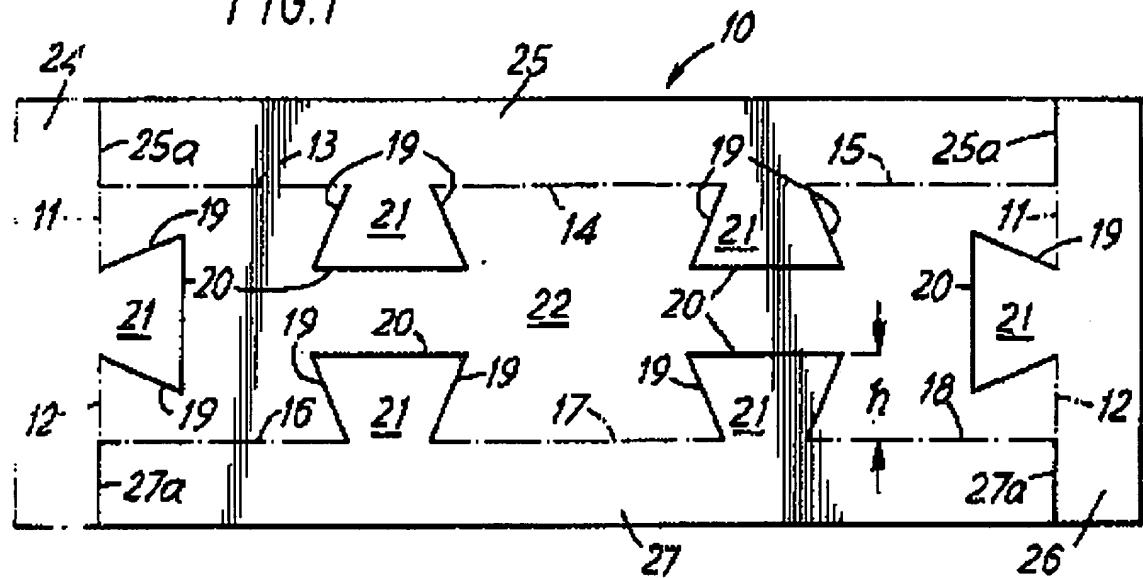


Fig. 2

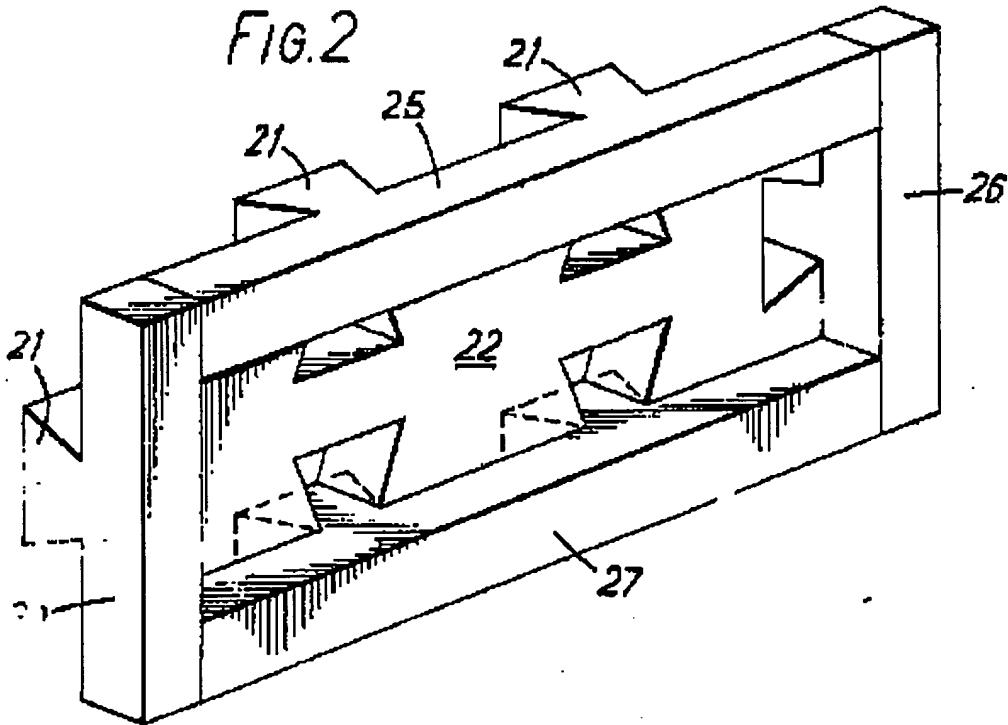


FIG.3

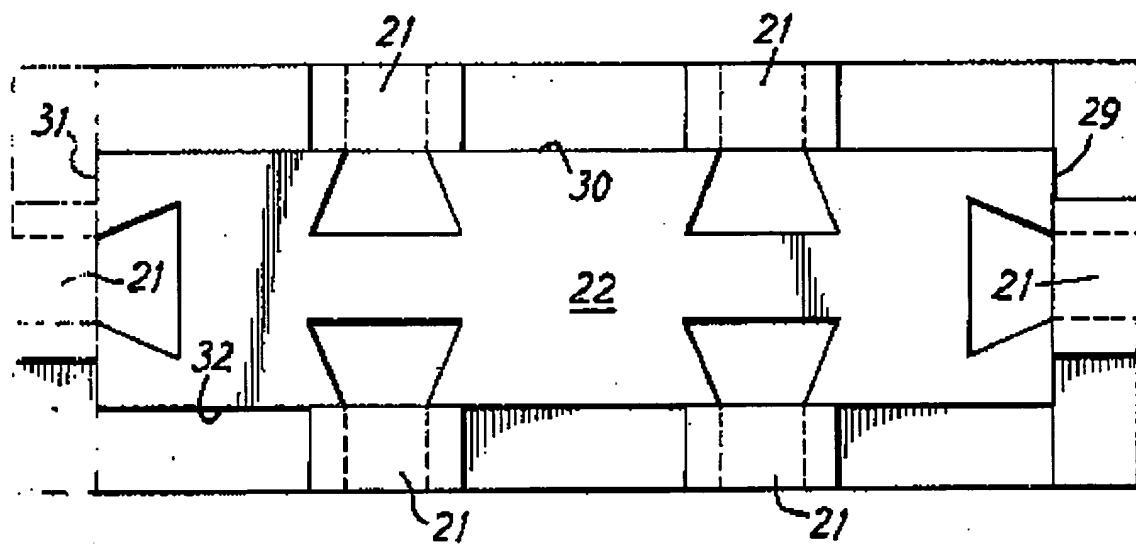
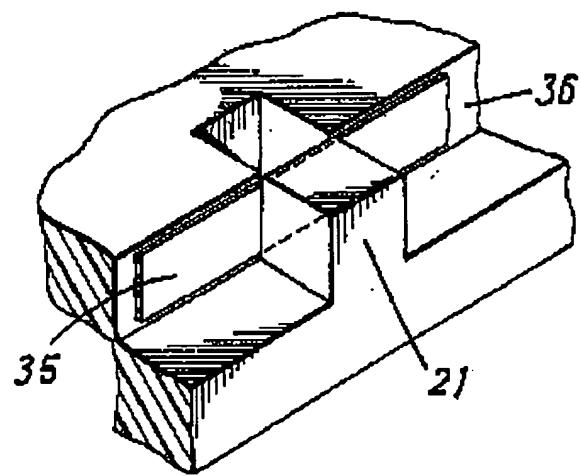


FIG.4



## SPECIFICATION

## Improvements relating to packaging elements

5 This Invention relates to packaging elements, and has a particularly useful but not exclusive application in shock-resisting packaging elements for objects which are in the form of a rectangular block. Cap elements moulded from expanded plastics, for example expanded polystyrene, extending over the ends of such objects prior to their insertion into cardboard cases have been found, when correctly designed and used, to provide a satisfactory degree of protection against shock damage, but these moulded expanded plastics elements necessitate the use of expensive moulds. In addition, the shock-resisting qualities of plastics material such as expanded polystyrene are variable and the packaging elements have therefore to be made stronger than may be necessary in order to meet a given shock resistance specification.

10 According to this Invention there is provided a packaging element comprising a pad of foamed rubber or plastics material having a plurality of collinear score lines extending through almost the full thickness of the pad from one face thereof, the thickness of the pad being entirely cut through along a line extending continuously between the adjoining ends of the or each adjacent pair of score lines, but laterally offset from the score line.

15 Preferably, the pad is made from closed-cell foamed polystyrene.

20 According to a preferred feature of the invention, the cut line extends entirely on one side of the score line, at least one of the end portions of the cut line extending at an acute angle to the adjoining score line. In a particularly advantageous construction the cut line extends in the form of a dovetail.

25 In one of the most useful applications of the invention a rectangular pad of closed-cell foamed polyethylene is provided with a plurality of collinear score lines extending spaced from one parallel to each edge of the pad, the adjoining ends of each adjacent pair of score lines being interconnected by cut lines extending in the form of a dovetail along which cut lines the material is cut through its full thickness, and all of the said cut lines being in the region of the pad bounded by the score lines.

30 By bending each of the edge portions of the pad through 90° a cap is formed for a rectangular object to be packaged, since the side edges of the dovetail formations prevent the edge portions from returning resiliently to

35 their original positions.

40 One embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

45 Figure 1 is a plan view of a packaging element according to the invention, the ele-

ment being shown in its flat form,

50 Figure 2 is a perspective view of the packaging element of Fig. 1 in its erected form, seen from one side,

55 Figure 3 is an elevation of the erected packaging element viewed from the other side, and

60 Figure 4 illustrates a modified form of the packaging element.

65 Referring to Fig. 1 of the drawings, the element shown comprises a rectangular pad or sheet 10 of closed-cell foamed polyethylene 4 mm thick. Two collinear score lines 11, 12 are cut through almost the full thickness of the pad and extend parallel to each end of the pad. Three collinear score lines 13, 14, 15 extend parallel to one lengthwise edge of the pad between score lines 11, and three collinear score lines 16, 17, 18 extend parallel to the other lengthwise edge of the pad between score lines 12. The score lines are in this instance all equally spaced from the edges of the pad by a distance equal to the thickness of the pad, and all of them are cut through almost the full thickness of the pad from the same face of the pad.

70 The ends of each adjoining pair of collinear score lines are interconnected by lines 19, 20 cut through the full thickness of the pad and defining a dovetail formation 21, and these formations are cut in the central area 22 of the pad, i.e. the area outlined by the score lines. The height  $h$  of each dovetail formation is conveniently substantially equal to the thickness of the pad. The edge portions 24 to 27 defined by the score lines are separated from each other by cuts 26a and 27a.

75 The packaging element is erected by turning each of the edge portions 24 to 27 of the sheet through 90° about the score lines, causing the element to take up the form shown in Figs. 2 and 3. A certain amount of resilient deformation of the material is necessary to move the dovetail formations 21 out of their

80 original positions. When thus erected, the divergent edges 18 of the dovetail formations co-operate with the edge faces 28 to 32 of the central area 22 to hold the element in its erected position. The element can thus form a

85 shock absorbing cap for one end of an article in the form of a rectangular block. It will be understood that by taking a pad of appropriate area and spacing the score lines the appropriate distance from the edges of the pad, the edge portions 24 to 27 can be made to extend as far along the article as required, but it may be necessary to cut away end parts of the end edge parts 24, 28 in cases where the required width of the end portions exceeds the thickness of the pad.

90 The illustrated arrangement is preferred, but in an alternative arrangement illustrated in Fig. 4 the formations 21 are rectangular instead of having divergent side edges 18, and

95 one or more places 35 of stiff card are

interposed between each formation 21 and the surface 38 of the central area 22 exposed by the scoring, so as to bridge the complementary notch in the erected packaging element and hold the edge portions in position.

#### CLAIMS

1. A packaging element comprising a pad of foamed rubber or plastics material having a plurality of colinear score lines extending through almost the full thickness of the pad from one face thereof, the thickness of the pad being entirely cut through along a line extending continuously between the adjoining ends of the or each adjacent pair of score lines, but laterally offset from the score line.

2. A packaging element as claimed in claim 1, wherein a lateral projection outlined by the cut line and an imaginary straight line colinearly interconnecting said pair of score lines has a shape such as to prevent the parts of the pad on opposite sides of the score lines from returning to their original positions after having been rotated out of a common plane through 90° relative to each other about the hinge formed by the score lines.

3. A packaging element as claimed in claim 2, wherein the cut line extends entirely on one side of the score line.

4. A packing element as claimed in claim 3, wherein the depth dimension of the cut line extends at right angles to the plane of the pad over the full length of the cut line.

5. A packaging element as claimed in claim 4 wherein the parts of the cut line adjoining the associated pair of score lines are divergent from each other.

6. A packaging element as claimed in claim 5, wherein the cut line extends in the form of a dovetail.

7. A packaging element as claimed in any one of claims 1 to 6 wherein said lateral projection has no dimension, measured from the score lines in a plane parallel to the faces of the pad, exceeding the thickness of the pad.

8. A packaging element as claimed in claim 7, wherein the cut line includes a portion extending parallel to the score lines which portion is spaced from the score lines by a distance equal to the thickness of the pad.

9. A packaging element as claimed in any one of claims 1 to 8, wherein the pad is of rectangular form and has said score lines and interconnecting cut lines extending generally parallel to and adjacent at least the opposite edge of the pad.

10. A packaging element as claimed in claim 1, having the two portions of the pad separated by the colinear score lines rotated relative to each other through 90° out of a common plane about the hinge formed by the score lines, and a strip or set of strips disposed between the lateral projection or projections one on each portion and a face of

the other portion which face is exposed by the scoring lines, the strip or strips being disposed in such a manner as to hold the two portions in the relative position into which they have been rotated, against the elastomeric restoring forces of the material.

11. A packaging element as claimed in any one of claims 1 to 10, wherein said material is a closed-cell foamed polyethylene.

12. A packaging element substantially as hereinbefore described with reference to and as illustrated in Figs. 1 to 9 or in Fig. 4 of the accompanying drawings.

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